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ABSTRACT

Educational institutions typically have data filed in many forms in many locations, making the task of gathering relevant data for any purpose a difficult process. The Davidson Community College approached the problem by studying management information systems in other North Carolina institutions, searching ERIC, and pursuing leads in journals of education and data processing as the first part of a two-year Occupational Education Research Project. Registration, grade reporting, and student records constituted the bases for the data bank since these areas are the repetitive, large volume bases for any educational management information system. Of the many systems that would serve their needs, they chose one based on the principle of collecting data only once, at the original source; recording the data on punched cards; and transferring them to computer center random access disk files where access was available by computer terminal. This system makes available data otherwise unavailable, which can have far-reaching effects. The report documents the searches and computer programs studied. Correspondence and sample documents are included in the appendixes. (AG)

ED 085593

OCCUPATIONAL EDUCATION RESEARCH
PROJECT FINAL REPORT

Vocational Education Amendments of
1968 (Public Law 90-576)

(Title I - Part C - Sec. 131 [b])

DEVELOPMENT OF DATA BANKS AND METHODS TO MEASURE EFFECTIVENESS OF OCCUPATIONAL PROGRAMS

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2. Norman S. Mills, Registrar
3. Anne B. Orren, Guidance Counselor
4. H. Herman Roach, Jr., Dean of Student Affairs

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ABSTRACT

There is a growing awareness by employers and students of the value of and need for good occupational education. Relatively smaller educational institutions are being pressed to fill this need. This creates, on one hand, requests by the institutions for a larger share of the limited resources of society; on the other hand, society is demanding to be shown that it is receiving full value for its investment. This is summarized in the current terms "Accountability," "Program Planning and Budgeting Systems," and "Management Information Systems."

Business, government, and larger institutions have led the way. They developed and utilized improved data management tools to replace limited clerical summation of data with computerized methods to turn data into information for analysis. This permits more scientific decisions more quickly. A competititive advantage results.

Problem and Objectives

The problem for institutions of our size is that we still collect volumes of data. We collect it on dozens of multi-part forms and file it manually in dozens of different offices. When information is needed to improve production and justify the need for resources, it is often non-existent. Getting the information usually requires more time and laborious clerical procedures than is possible with staffs kept busy collecting and filing the forms. We need to learn how to bank this data and develop methods for making withdrawals as needed in the appropriate format. We can learn from those who have done this.

Procedures

We approached the problem by searching for successful systems that would serve our needs for converting data into management information. We looked for the existence of such systems in sister institutions and organizations such as The North Carolina Educational Computing Service (NCECS) and The National Laboratory for Higher Education (NLHE). We searched reports of more remote institutions by using Educational Resources Information Center (ERIC) and following leads in journals of education and data processing. Simultaneously, we worked to build a data bank and to continue automation of our registration and grading system. Registration, grade reporting, and student records are the repetitive, large volume bases for any educational management information system, just as computerization of payroll was the first step for most commercial organizations. We also started to make analyses that had not been practical with paper files. This was to begin testing our hypothesis that the value of information available from data banks would be worth the cost of creating and maintaining the banks and the cost of developing programs to retrieve the information.

Findings

We found many systems that would probably serve our needs. All are based on the principle of collecting data only once, at the original source; recording this data on machine input media such as punched cards; filing these in a central location, usually on random access disk or tape files; organizing the files in such a manner that data in each can be related easily to data in others; and developing programs to access the data. At least 80-85 percent of the data elements are common to all systems. Although most educational institutions are unique, this is true for only 10-15 percent of their activities.

The "Results" section of this report describes several of the most appropriate systems available for local adaptation. Mention is made of one system that might be appropriate for very small institutions. Other systems call for various combinations of manual, punched card, and computer systems: where the files are maintained and accessed on the site, at a remote location by a service company, or by computer terminal.

We found the most economical route for us was to use punched card data bases that had been started for us by a service company; transfer these to Triangle Universities Computation Center (TUCC) random access disk files and expand them; and access this data bank by computer terminal, using utility programs available at TUCC, as well as our own programs, to produce management information reports.

Conclusions

Any institution can improve its management information with a relatively small initial investment. The investment will be larger in proportion to the sophistication of the system. The first step is to convert present data files to data banks maintained on punched cards, on magnetic disk or tapes, or on a combination of these. The choice will be determined by the type of equipment and location of equipment to be used for processing: i.e., punched card accounting machines or computers, either owned or leased by the user or by an off-site service organization. Overall savings are seldom realized, but management information not otherwise available can be produced on a timely basis, and staffs are freed from some clerical activity to perform more professional, productive work.

Recommendations

Personnel responsible for data processing in all technical institutes and community colleges in North Carolina should attend a session of the Educational

Data Processing Training Program. They should also take advantage of:

1. the powerful computing capability available through TUCC (for administrative as well as educational data processing) and

2. the work already done through the Appalachian State University Computer Center and five two-year institutions of the Appalachian Consortium Special Development Project on a uniform administrative data processing system.

The Department of Community Colleges should encourage the building of common data banks, maintained at TUCC, to reduce reporting requirements. This would also enhance expansion of these data banks to provide utilization of the National Center for Higher Education Management Systems (NCHEMS), data from the Department of Public Instruction, and Higher Education General Information Survey (HEGIS) reporting.

PROBLEM

A wealth of data exists in files of various offices. There is data on potential enrollees, students, staff, alumni, curriculum, scheduling, books for resale, learning resources, equipment, and facilities. The administration and faculty needs summation and interpretation of this data. Then, improvements in curriculum, guidance, articulation, and placement can be planned and implemented. Students can be guided to pursue training related to interest, capability, and anticipated employment opportunities.

The problem, therefore, is to file all the data so that it will be readily available for timely retrieval of any statistic compared with any other, for analysis, for planning, and for solving current problems (Exhibit A); and then to develop methods of accessing the data to provide information of substance for the administration's and faculty's use in decision making.

It is known that business, government, and educational institutions have similar needs for management information. Many have developed methods for meeting these needs, with varying degrees of success.

Through state supported computing services of the NCECS and other government subsidized organizations nationwide, several institutions have developed administrative systems for data management for educational institutions. Our problem is to find the system most likely to satisfy our need and to adapt it to our own use. (See Abstract of Proposal--Exhibit B)

OBJECTIVES

The primary objective of this project was to survey educational institutions and literature to locate successfully operating systems of data storage and retrieval to determine if an existing system would serve our needs, or could be adapted to do so. Size and objectives of the systems were critical here, since many large scale systems are known to exist but may not be economical or practical for smaller institutions. Manual systems were also sought, due to cost of automated systems.

The hypotheses were as follows:

1. that automated, rather than manual systems would be required to do the job for all but the smallest institutions (under 500 students);

2. that questions similar to those in Exhibit A could be answered from data bases accessible by computer at a cost that would be economically feasible, in terms of value of new information available, to justify purchase of service or lease of equipment.

The secondary objective was to build data bases and test the selected system, and then based on analysis and evaluation of results, to refine the data base and system.

The hypotheses were as follows:

1. that some prior assumptions made without the benefit of quantitative data would be confirmed, and some rejected;

2. that the need for more and different data collection would be indicated, and the worthlessness of some data currently gathered would be revealed.

The third set of objectives was to document the system and make it available to other institutions.

It was recognized that evaluation and refinement would be ongoing beyond the life of the project.

The overriding objective was to benefit the individual student by marshaling the most pertinent available data to get him attracted to and placed in the proper program for a more productive life in an occupation available to him in the area served by the institution, or another of his choice.

Approval Limitations

The approval of the project carried stipulations emphasizing the report of findings of other systems studied, and the investigation of State supported services and software with North Carolina Educational Computing Service (NCECS). (Copy of Notification of Approval attached--Exhibit C). Estimated cost of computer processing time to fully test results, as well as contingency funds, were not approved as part of the project, but were expected to be made up by the local institution insofar as possible.

PROCEDURES

Summary

The Project Director, a staff member released from one-half of his regular duties for the two-year life of the project, performed the bulk of the research, part of developmental activities, and coordinated the services of consultants, with advisory assistance from key staff members.

First Year--During the first year of the project, primary emphasis was on searching for evidence of other studies to avoid duplication of research effort. This consisted of:

1. a questionnaire survey of all technical institutes, community colleges and private junior colleges in North Carolina;
2. visits with NCECS, NLHE, MIS, and selected institutions;
3. a literature search of ERIC research collections;
4. constant surveillance of publications in the data processing field;
5. surveys of computing capability;
6. correspondence with selected individuals as a result of the aforementioned steps; and
7. attendance at diverse related meetings.

Simultaneously, implementation of a computerized registration and grade reporting system developed by a local service company was implemented, providing a student record data base.

Also, an alumni survey was conducted, in an effort to build an alumni data base.

Second Year--During the second year of the project, as a result of the findings during the first year, conversion of equipment by our servicing consultant, access to our own computer terminal, and new services offered by The Educational Testing Service, most of our effort was spent building our data bases, adapting the programs to run on the TUCC computer, and testing a limited number of uses of the system.

The availability of graduate students from Wake Forest University to test our hypotheses in a limited area of concern, and a pressing need to inauguarate a new articulation effort, redirected the testing effort to equally important but different questions than originally posed. Redirection of effort was anticipated for the post analysis period, but came earlier than was originally anticipated, and postponed originally anticipated tests until after completion of the project. This phase will not be complete now until 1974.

Continued surveillance of publications and follow-through of leads established during the first year were, and are, continuing. Educational data processing is a rapidly developing field, particularly with the promotional efforts of the NCHEMS and related organizations.

Search for Available Systems

Letter Survey--Exhibit D comprises copies of letters sent to the 56 institutions in the community college system in North Carolina, requesting summaries of methods currently employed in recording and reporting occupational student data.

The first letter (Exhibit D1), from the President of our institution to presidents and directors of occupational education of the receiving institution, prompted replies from 24, or almost half, of the institutions. However, the request was too general. While most respondents invited the director to visit

the institution for personal review of their activities in the area of study, only one sent a summary of an operating "management by objectives" system, and this dealt more with operational guidelines than quantitative measurement. Four others supplied summaries of elements such as faculty evaluation and community surveys. Five of eleven known to have some automated system did not reply.

Questionnaire Survey--In order to bring the objective into closer focus, and to limit personal visits to those institutions with concrete examples to study, a second letter (Exhibit D2 or D3) with questionnaire (Exhibit D4) was sent to the same institutions and to 12 private junior colleges.

Of the 29 replies received: three were from the 12 junior colleges; 13 were from institutions that did not reply to the first letter; and nine respondents to the first questionnaire did not reply to the second. The Appalachian Developing Institutions consortium, comprising eight of the institutions, was authorized to represent five of them in the study, thereby including an additional four institutions, again just under half.

This time we only received replies from six of the 11 known to have automated systems including three that did not reply the first time and losing two that did.

Only two acknowledged having an automated system for filing and retrieving quantitative data, using punched cards and an IBM 402 Accounting Machine--one for scheduling and another for registration.

Only three acknowledge having a manual "system" for some phase of operation, with none for curriculum planning or remedial programs.

About this time, the Management Information Systems division of the State Board of Education had convened a Community Colleges' Administrative Data Processing (ADP) Steering Committee to study the present state of administrative data processing at six or seven institutions.

It was decided to await results of this effort before visiting schools individually. (Refer to page 13)

ERIC Research--The Research and Information Center of the North Carolina State Department of Public Education in the Education Building in Raleigh has access to Current Indices of over 500 Journals in Education (CIJE) and over 74,000 microfiche cards (as of 1/1/72), each containing dozens of pages of Research in Education (RIE) reports, filed with the Educational Resources Information Center (ERIC), supported by the U. S. Office of Education and comprising a central and twenty regional clearinghouses nationwide. The center provides computer generated bibliographies on any subject, with abstracts, and microfiche reproductions for 10 cents a card (or one may read the original at the center.)

This is an automated extension of the ERIC Research in Education and Index to Journals in Education found in the reference areas of many libraries.

A search of this file produced a dozen documents, only two of which had much bearing on our project. Excerpts from these two are noted in the "Results" section of the report. (Page 19)

Surveillance of Publications--From inception of the idea of applying for funds to finance the project, as the application began to bring it into closer focus, one of the more productive sources of information resulted from a constant awareness of tne problem and objective while browsing through

educational and data processing publications, and during discussions with people interested in the concepts.

Enoch Haga's book Automated Educational Systems came to the director's attention in this way. In his preface, the editor summarizes the subject matter of the book as follows:

> Part I, Concepts and Patterns, consists of eight chapters designed to introduce the reader to some of the concepts and potential applications for education to systems, including the use of computers. Chapters 5 to 8 show possibilities in local, regional, state, and national educational data centers of information systems. Part II, Applications and Techniques, runs the gamut with its selection of administrative and instructional applications and computerized techniques. The ten chapters give a good outline of what can be achieved in such areas as student accounting and scheduling, computerized sectioning and class scheduling and computer-assisted instruction.[1]

Similarly, one of the more valuable references, A Study of Regional Computer Networks[2], as well as references to commercial, semi-commercial and other systems, and other references cited later in the report, resulted in leads from news items and advertisements in data management and education publications.

Meetings--Meetings with personnel of NLHE were held to investigate the feasibility of their recently announced Management Information System, which was not yet adapted to hardware available to us, (originally developed for an IBM 1130) but is available to TUCC users now, and has been adapted for other systems.

Meetings were also held with systems analysts of the Division of Management Systems of the North Carolina State Board of Education (MIS); the

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[1]Enoch Haga, ed., Automated Educational Systems (Elmhurst: The Business Press, 1967), Preface.

[2]For personal reference, see Fred Weingarten, et al, A Study of Regional Computer Networks (Iowa City: The University of Iowa, 1973).

community colleges ADP steering committee; and community college electronic data processing personnel and administrators at annual community college conferences.

At the 1971 conference, MIS personnel presented an overview of the tentative objectives for a modular Management Information System for the state, to be implemented over a period of years, which would influence the local systems, since the state system is to receive data from local systems in a to be prescribed format. The early modules deal primarily with public schools and administrative offices.

By 1972, the community colleges' ADP steering committee was supporting the efforts of MIS to develop and pilot test a system for student admissions, registration, scheduling, attendance reporting, and grading to be available through TUCC and to provide data to the Department of Community Colleges as a by-product. It was to be based on the analysts' study of systems already functioning in several institutions. This duplicated a planned phase of this project, so the director delayed detailed analysis of other institution's operating systems and offered our school as the pilot. The key MIS personnel resigned before completion of the project, and it is now dormant.

At the 1973 conference, it was revealed that more institutions were developing their own individual systems, making it harder to develop the common system envisioned.

Meetings were also held with NCECS; International Business Machines and competing suppliers of hardware and services; Bell Telephone Company; and potential partners in utilization of a computing capability in local and county government agencies. Acquisition of a Burrough's L-4100 electronic accounting machine as replacement for a worn out mechanical bookkeeping machine prompted meetings to determine how this might affect our

data bank and systems needs. There was little immediate effect for occupational programs, since auditors limited use to pre-programmed financial applications.

These meetings led to installation of an IBM 2770 computer terminal with telecommunication connection with TUCC to provide educational data processing capability, as well as to replace some of the contractual services originally planned for the implementation of the data processing portion of this project, and to test the economics of implementation of findings.

It was also while meeting with NCECS that the director became aware of the ASAP system for data management, discussed further under the section, "Results." (Page 24, ASAP)

A community college member of the Title III Appalachian Consortium Special Development Project forwarded our initial survey letter to the Consortium Research Coordinator. A meeting with him resulted in our using their Alumni Questionnaire as a model for our survey instrument (Exhibit H). We also discussed, among other projects, plans for development of an information system to manage student data. ASU had collected and organized the data elements, but there was no existing system for this purpose at that time (though ASU had developed systems for their own use). ASU is now serving as a service bureau for electronic data processing of registration and student records for several community colleges. (See "Results", Page 25, ASU)

Search for Access to Computing Capability

Announcement of the installation of a Control Data 3170 Computer at neighboring North Carolina Agricultural & Technical State University led to a sub-project of meeting with seven other members of the Piedmont Consortium of the Department of Community Colleges to analyze a probable source of more economic access to computer capability then currently available, gaining

access also to years of experience gained by Control Data Corporation as one of the commercial leaders in large scale educational systems, as well as A & T's own administrative data processing system, under development at that time. This alternative did not prove to be sufficiently attractive to warrant the prior economic commitment of enough institutions to apply for a network grant from the National Science Foundation.

Correspondence

Correspondence was initiated early with organizations such as the Center for Vocational and Technical Education at Ohio State University, Center for Occupational Education at N. C. State University at Raleigh, the Society for Data Educators, National Science Foundation, authors, advertisers, and leads resulting from the above. Findings of significance are recorded in the "Results" section (page 19) and proper credit given.

Implementation of Registration and Grading System

An officer of a local industry with free computer time had designed punched card student records for us and written programs to replace our manual registration and grade reporting system with a punched card system that produced printed grade reports, printed labels for transcript cards, student rosters, punched card attendance records for the Department of Community Colleges, and various statistical reports. This had been used for one registration.

Anticipating that this might serve as the base for whatever system resulted from this research project, the director assisted in making changes necessitated by experience gained during the use of this new system during the first registration, such as redesigning application, registration, and drop/add forms for simplicity and eliminating forms and duplicate copies of forms used by the manual system, but not needed for the automated system.

Two unanticipated conversions by the service company required more coordination effort by the director during the second year than had been planned; however, these conversions subsequently made the final building of data bases and development of systems somewhat easier. First was conversion to another model of computer (from IBM 360-20 to IBM System/3). Second was a later conversion from punched card data base to data bases maintained on disk packs.

Another unanticipated occurrence was the acquisition of a computer terminal, necessitating learning a new job control language and the operation of different equipment than that with which the director had experience. However, this also had its compensating benefits by providing the power of many utility programs available at TUCC for maintaining data bases, allowing greater flexibility in managing data without having to develop or buy such programs. It also provided an additional dimension of communication with personnel from other institutions pursuing the same goals as this project through NCECS seminars, and through systems documentation provided by TUCC, NCECS, AND IBM.

Building Data Bases and Testing Hypotheses

Shortly after acquiring our computer terminal, we recorded on disk files the Comparative Guidance and Placement Test Results for all students (approximately 3,000) admitted since the inception of the program in 1971. These are purchased from the Educational Testing Service and are contained on IBM cards--three for each student.

Having these records permitted sub-contracting, to two graduate students, studies relating academic motivation of various programs to several variable characteristics, to aid in counseling; and relating variables to dropouts Results of these studies comprise Exhibit F.

Planned testing of hypotheses was delayed due to the lag in getting current and past academic records on disk for other correlations. However, one unanticipated study on high school dropouts resulted from having computing capability.

Data bases have just been completed for student records of currently enrolled students, course offerings, and faculty, and we will do our own registration for the first time this fall. Then, as we load prior records, we will attempt to complete planned tests.

Alumni Questionnaire

Simultaneously, to build our Alumni Data Bank, a questionnaire was developed and sent to 800 alumni who had attended school during the 1970-1971 school year but did not enroll in the fall of 1972. Producing mailing labels for the addresses was the first use of our punched card data file prepared for State Report 7-1 information, available a full quarter before the state report. The questionnaire was a close adaptation of one used successfully by the Appalachian Consortium.

Only 27 replies were received. Thirty-five were returned undeliverable.

Time, staff and funds did not permit employment of methods found to be successful by Appalachian, and later by Guilford Technical Institute in a similar research project, funded under the same umbrella as this project. Therefore, this phase of the project was postponed to be undertaken at a later date.

Educational Data Specialist Training Program Seminar

Probably the most profitable wrap-up of the project came after official termination on June 30. From July 23-27 the director attended one of six regional sessions of The Educational Data Specialist Training Program,

administered by the American Association of Community and Junior Colleges and the American Association of Collegiate Registrars and Admissions Officers. See "Results" section following for further discussion.

RESULTS

Student records and other data bases stored on machine accessible files (punched cards or electronic storage media such as tape or disk) make it possible to cross-tabulate a wide variety of elements of data and to obtain a good picture of the institution, sometimes refuting conceptions formed without the benefit of documentation.

No manual system[3] was found that produces the answers that were sought, due to the limitation of not having enough clerical personnel to manually count folders or to tabulate records on even as few as 500 students.

Data in files accomplishes nothing unless it can be retrieved when needed to answer questions. Management information often requires correlation of data which has never been previously combined. Registrar's personnel can better spend time on counseling, articulation, administration.

For smaller institutions (under 1000-1500 FTE), with limited budgets, records kept on punched cards and processed mechanically by electrical sorters, collators and accounting machines provide the basis for obtaining a wealth of information not as readily available from manual records retrieved manually. With the growing demand for accountability, however, and the need to compare the results of an institution with norms, the

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[3]Time did not permit review and evaluation of one system cited as a manual operation (AIDS) utilized at Portland State University, listed in William Shoemaker's Systems Models and Programs for Higher Education (Washington: Academy for Educational Development, Inc., 1973). This came to the director's attention just before the end of the project.

electronic computer processing of data stored on random access files is becoming essential, or at least a combination of punched card unit record equipment and computer processing. This can be provided by a service center, as at ASU for several institutions, by computer terminal, or on an in-house computer.

Many systems are available. Though most educational institutions are unique, they are unique in only 10-15 percent of their activities. At least 80-85 percent of what they are doing is essentially the same for all institutions.[4] Therefore, many systems already developed will serve as is, or with some adaptation, or at least provide the logic and outline of procedures.

You cannot plug a machine or computer in and expect production. A system takes development. But once developed, time, effort, and frustration (by students supplying the same data over and over again, and by administrators not having ready access to answers) can be saved by collecting data only once, and having it when and where needed to answer a variety of questions.

Summary of Available Systems

Several systems were found that might be helpful for institutions getting started or desiring to improve systems:

> A Small College Information System in operation at Freed-Hardemen College in Tennessee is summarized in a report by Fred K. Bellott, Memphis State University, and Sam W. Bliss. This System, for 850 students, developed under Title III Grants during the period from 1966 to 1971, uses punched card equipment, and an off-site IBM 1130, 8K computer with disk located at another college. A list of the data bases comprises Exhibit G.

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4 _____. The Educational Data Specialist Training Program (Washington: American Association of Community and Junior Colleges, 1973). Unit 5, Page 1.

The booklet includes fairly detailed flow-charts, pictures of data collection forms, lists of equipment, and samples of reports. Authors state that:

> The output documents generally serve one or more of the following functions:
>
> a. Reporting statistical tabulations and summaries of academic performance of students.
>
> b. Reporting descriptive characteristics of college students and faculty personnel.
>
> c. Generating enrollment projections and attendant faculty resources required for administrative planning.
>
> d. Identification of factors affecting faculty retention, academic student load, salary schedules, and expectancy-success tables.
>
> e. Administrative reports requested or required by accreditation and/or funding agencies.
>
> f. Financial accounting reports for fiscal management of the institution.
>
> g. Operational reports for administration of the institutional program; e.g. grade reports, student and faculty schedules, inventories, space allocation, budgeting planning and resource allocation.
>
> h. Alumni reporting and communication.[5]

College and University Systems Exchange (CAUSE), 737 Twenth-ninth Street, Bolder, Colorado 80303, was organized in 1971 and represents 400 members in 120 institutions. It provides to members abstracts (free), documentation (minimal cost) and source programs (reproduction cost) of administrative systems submitted by other member institutions.

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[5]Fred K. Bellott, et al, A Small College Information System (Memphis: Memphis State University).

One sample abstract ordered by the project director is for a Student Records Information System, designed for community colleges comprising 68 assembly language programs to be run on an IBM-360/25 (24K) operating under DOS. It is a batch system designed for on-line use, producing audit trials with error messages. Based on a student data base of 960 bytes (characters of information), it serves scheduling, registration, grade and statistical reporting, including all WICHE elements (see WICHE, page 24).

The May, 1973, index included five pages of programs (over 300).

Systems Models and Programs for Higher Education, published by the Academy for Educational Development, Inc. (a non-profit organization), 1424 Sixteenth Street, N. W., Washington, D. C. 20036, in April, 1973, summarizes a study by Dr. William A. Shoemaker, on the staff of the Council for the Advancement of Small Colleges, and includes references to model systems and similar systems developed subsequent to the original study. Single copies are free from the Management Division.

The cited models were designed to perform various functions in improving higher education management in small and medium sized colleges. They include expensive proprietary systems as well as those in the public domain and variations between these two extremes.

Systems developed primarily to collect and utilize data for information and control of current operations include the following:

> Administrative Information Distribution System (AIDS), Portland State University, a manual system with a data base including information about students, finances, faculty, personnel, and facilities. Dr. Shoemaker states that, "It can computerized without difficulty."[6]

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[6]William A. Shoemaker, Systems Models and Programs for Higher Education (Washington Academy for Educational Development, Inc., 1973) p. 5.

On-Line Administrative Information System (OASIS), Stanford University, Project INFO (Information Network for Operations). Dr. Shoemaker states that, "The system is built on the aggregate of files from various university offices . . . the system requires at least a medium-sized computer and rather high cost terminal units . . . feasible for a small college only a shared-time or consortium basis . . . a special feature is . . . security provisions to prevent unapproved access."[7] Terminals may be operated by non-technical personnel to produce "tailored" reports.

Several commercial systems, primarily for planning; budgeting, simulation, and information exchange; and some discussed elsewhere in this report, are also summarized.

Other commercial systems for which some detail was supplied by vendors include:

THESIS (Dataflex Corporation), developed primarily for secondary school districts but which appears from data supplied to have possibilities for adaptation by non-resident community colleges. It is built on a flexible student data-base, accessible by several sub-systems.

EPIC (IBM), NCR Educational Systems, Edusystem/EDP (Digital Equipment Corp.), Control Data, Hewlett Packard, Univac, and most other hardware vendors supply some administrative systems software or help. Details of all of these were not sought, since they are usually keyed to more specific hardware configurations and frequently are all encompassing for a variety of institutions or developed for specific institutions and adapted.

The National Laboratory for Higher Education, Mutual Plaza, Durham, NC 27701, has developed an Information System, originally written in FORTRAN for an IBM 1130, 8K, single disk, but adapted by some users to other systems and language, and is reportedly in use by over 200 colleges.[8] It was offered for $25, including software in the form of punched cards, systems manual and user's manual. Adaptation to run at TUCC on a 360/165 is nearing completion of final testing and documentation. With the expiration of funded support, the cost will be higher (around $500). (The director just received a copy of NLHE Information System S/360 User's Guide.)

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[7] Ibid. p. 3.

[8] Ibid. p. 14

It is primarily a disk data set management and report generating system, allowing relatively wide latitude for data base characteristics and accessible through simple instructions to non-programmer users (but submitted through data processing personnel for actual access of the data-base). The descriptive paper presented to the 16th annual College and University Machine Records Conference include sample file formats and outputs.

The director could not test the system because software was not available for the hardware at his disposal and the scope of the project did not permit adaptations required. However, since random access data bases are the foundation for most acceptable systems; and flexibility in accessing the base by a variety of languages and programs, rather than a fixed system requiring a fixed data base configuration; the director is anxious to test this system. NLHE also has other planning programs, under development, summarized in Dr. Shoemaker's catalogue.[8]

ASAP File Maintenance and Information Retrieval System, Compuvisor Inc., P. O. Box 381, Ithaca, New York 14850, is described by the University of North Carolina (UNC) applied programming group as "a language and a supervisory system designed specifically for the creation and maintenance of a master file, and the selective retrieval of information from that file."[9] (emphasis added) It is more sophisticated than the NLHE system, and requires more hardware, yet it is simpler to achieve more varied outputs, with security of data base, than many languages, or systems.

It is available at a fraction of the commercial cost for instructional purposes. It is available to TUCC users under Library Service Series Document No. LS-136-1, September, 1972.

Copies of the Introduction, Reference Manual, and Reference card can be ordered for $3.00, $3.00, and $.50 respectively from Compuvisor or the UNC Computation Center Library.

The National Center for Higher Education Planning and Management Systems (NCHEMS) at WICHE (Western Interstate Commission for Higher Education), P. O. Drawer P, Boulder, Colorado 80302, (financed largely by USOE[10]), has produced some programs available at a minimal cost for those participating in its projects.

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[9]TUCC Document LS-136-1, September 1, 1972.

[10]Shoemaker, p. 6.

The basis for NCHEMS is a detailed definition of data elements defined in a Program Classification Structure, providing common or uniform definitions of the desired data organized by such general categories as students, staffing, facilities, and expenditures. It is coordinated with reporting requirements of USOE through HEGIS (Higher Education General Information Survey) and designed to provide a program budget for the primary and support activities of a wide variety of institutions from occupational and vocational instruction at community colleges to complex research universities. It is a program planning and budgeting model for accountability.

A group of 60 colleges and universities, including a consortium of a dozen junior colleges, have entered into an Information Exchange Procedures project. Results of a field test at Triton College, a public Community College and Technical Institute at River Grove, Illinois, are available.

Some examples of facts produced are a description of the students in terms of percent of full-time students just out of high school; the grade point average for the first term; percent in each age group; residents of district in terms of full time and part time enrollment; average ACT composite score of entering students; and number of credit hours, cost, and faculty to credit hour ratio for each career curriculum, etc.

The program does take the time and cooperation of the entire staff and faculty in a manner similar to a self-study for accreditation.

The Appalachian Developing Institutions Consortium, Progress Report No. 3, edited by Dr. Elmo Roesler, summarizes "the development and implementation at Wilkes Community College of a registration/student data system, the prototype of systems to be implemented in 1973 and early 1974 at Haywood Technical Institute, Isothermal Community College, and Western Piedmont Community College."[11] Since that time (February, 1973), Dr. Roesler stated that Asheville-Buncombe Technical Institute has made plans to implement the system. He also states that "The North Carolina Department of Community College personnel believe [the system] has many features worth adopting for the state management information system."[12]

The system, which was developed by Mr. Art Gloster, the Director of the Appalachian State University Computer Center in response to ideas expressed by Dr. Howard Thompson, President, and Dr. William Richardson, Vice President, at Wilkes, is flexible in order that it can be adapted to other technical institutes and community colleges with a minimum of effort. The report

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[11]Elmo Roesler, ed, The Appalachian Developing Institutions Consortium Progress Report #3 (Boone: Appalachian State University, Feb., 1973) p. 1.

[12]Ibid. p. 4.

includes flow charts for the system, and summarizes reports produced in registration and grading.

At present, hard copy input and output is being physically transmitted between the computer center at Boone and the served institutions. However, service by terminal is being considered. Also, further development is underway to expand the base system to a total information system which will include institutional management applications. Toward this end, the report also covers other projects dealing with business-community surveys; and high school image, alumni and attrition studies, with copies of survey instruments and summaries of successful results.

TUCC Software--In addition to providing all the major programming languages, the TUCC program library provides all the vendor's utility programs; many additional ones developed by NCECS, users and other networks; and even some commercial programs such as NLHE Information System and ASAP, discussed above on page . (In addition to the volumes of computer-assisted instruction programs).

This permits wide latitude in building and accessing data bases. There is no charge for using these programs other than processing time and input output charges included in the billing formula.

The utility programs were very useful and economical in time and cost (compared with programming each application) in building, maintaining and accessing our data bases and producing reports. Ability to choose the language most appropriate for the application, or best known by the user, is also of great value to the occasional user as well as to the most versatile programmer or operator.

Western Institute for Science and Technology (WIST), a nonprofit corporation supported by the USOE through the Nationwide Educational Computer Service (NECS) is in the development stage but is already serving colleges through terminals to the central computer in Texas. Information may be obtained from P. O. Box 1581, Waco, Texas 76703.

Related Literature Surveys

The Educational Data Specialist Training Program syllabus may be available in limited quantities from the director, Dr. Aikin Connor, office of Data Management, American Association of Community and Junior Colleges, One Dupont Circle, N. W., Suite 410, Washington, DC 20036. Jointly sponsored by the American Association of Collegiate Registrars and Admissions

Officers under a U. S. O. E. grant to Western Nevada Community College, this is an excellent guide to the uninitiated in the concepts and techniques of the collection, storage and reporting of data, as well as a bench mark for analysis of existing systems. A set of audio visual materials developed by the staff of the University of Oklahoma enhances understanding of the concepts.

A Study of Regional Computer Networks, serving institutions of higher education in the United States, under National Science Foundation Grants GJ27723 and GJ27724, was published by the University of Iowa in February, 1973. The authors state that, "regional centers can be a valid economic and educational approach to providing good computer service to small colleges."[13] They also are convinced that, "barring a remarkable new technology development, collegiate networks will inevitably continue to spread and develop."[13]

With emphasis on the use of computer terminals for academic purposes such as computer-assisted instruction, administrative uses are recognized and discussed. The authors cite definite advantages (and disadvantages) for small colleges with limited staff and resources if the proper facility is available.

Smaller and medium sized institutions in North Carolina, in particular, are fortunate to have access to one of the best educational computer networks in the nation. Inherent difficulties of network operation and communications are far outweighed by the benefits derived, in the considered opinions of this project's directors.

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[13]Fred W. Weingarten, et al, A Study of Regional Computer Networks (Iowa City: The University of Iowa, February, 1973) p. 236.

Before this study became available, our institution had determined that the Triangle Universities Computation Center at Research Triangle Park (accessed through and served by North Carolina Educational Computing Service) would be the most economical means of obtaining large scale computing capacity with a wealth of catalogued and utility programs. It was gratifying to have independent confirmation of our decision to choose this access to computing capabi ity from many alternatives available, such as Service Bureau, In-house Computer, unit record equipment, or continuing and improving manual systems.

One very valid caution is that a single (probably part-time released, at best) coordinator on a remote campus cannot handle the administrative programming, scheduling and production, as well as computer assisted instruction.

Development of Data Bases and Programs

A local industry, Mid-State Tile Company, headquartered in Lexington, North Carolina, developed for us a registration, grading and student record system. Then the company served as a computer service center during our registration and grade reporting periods, providing input forms, output reports and processing at cost, as well as personnel to monitor the registration process.

The original plan for the project was to have them expand the data base to include Comparative Guidance and Placement (CGP) test results on entering students, and alumni data, as well as to develop programs for analyses of the data.

On our acquisition of a computer terminal giving access to TUCC's IBM 370/165, and TUCC and NCECS's library of programs, Mid-State magnanimously offered to give us documentation of the 20 proprietary programs

comprising the software for the system, for us to adapt them to run on the TUCC computer system for our own use. We are not free to reproduce the documentation, but it can be made available. This allowed us to accomplish more than would have been possible otherwise.

As a result of later than anticipated delivery of the terminal (September, 1972), normal delay in getting it operational due to lack of experience with this particular equipment and normal initial communication problems, and problems in converting from card to disk files, we have just completed converting the programs and loading the student record files, and will conduct our own computer-based registration for the first time in the Fall of 1973. (The system has been fully tested. Parallel runs are not feasible.)

Therefore, statistical analyses were limited, but a few are reported in the next section of this report, to confirm our hypotheses, and full scale analysis is expected within the coming year.

Our Data Bases consist primarily of:

CGP (Comparative Guidance and Placement) Test results on all students entering since 1971. A list of items included comprises Exhibit E.

Student Master File, a 191 Byte Record containing all data from the application for admission and the permanent record, in index sequential file for random access.

Catalogue of all course offerings

Course file, containing section lists for all courses offered during the current quarter.

Faculty file, listing all full and part time faculty, and currently being expanded to include staff and all data concerning faculty and staff except payroll. (Burroughs L4100 electronic bookkeeping equipment is currently used for financial systems until programs can be developed for computer processing by terminal.)

High School Dropouts, listing name, address, telephone, birthdate, high school, year terminated, sex and race, for all dropouts from county schools for the two prior years.

All of these files can be transformed relatively easily into varying formats, combined, and abbreviated.

Output Reports--From manipulation of these data bases, we regularly produce the following recurring reports:

Student Master Cards (for registration)
Course Cards (also serving as drop/add and grade cards)
Section List (preliminary, after drop/add, & with grades)
Student Schedules (and grade report)
Cumulative Student Directory and Attendance by Quarter
Statistical (curriculum report and other)
Permanent Record Labels
Address Labels
Instructor's End of Quarter Report
Curriculum Data Card
Dean's List
Academic Probation
Honor's List

Computer production of other recurring reports are planned from these data bases, such as:

Class Schedule Worksheet
Grade Distribution Chart
Faculty Directory
Faculty Door Schedule and Locator
Salary Distribution Record
Telephone Directory

It is also planned to produce transcripts, in the place of Permanent Record Labels and Grade Reports.

Programs

The data bases are built and edited by use of utility programs at TUCC, such as COPY and EDITOR, requiring only a minimum of variable control instructions to achieve a variety of data management functions, and output. IBM utilities are used for Index files. TUCC's LABELS program is used for address labels and some listings.

Programs for reports are in the Reports Program Generator language at present, but we anticipate conversion to a more economical language. These programs are also stored on disks.

The TUCC systems allows a wide variety of file organization, storage media, and languages. As sophistication is gained, this permits choosing the most appropriate one for each job. Also, various statistical analysis programs are available for research and special studies.

Analyses

Using the above enumerated data bases built for this project, and statistical programs available at TUCC, two Wake Forest University graduate students performed statistical analyses of the data to determine:

1. the relationship between factors on the Comparative Guidance and Placement Test and persistence among first year students
2. the relationship of selected student variables to academic motivation scores on CGP.

There reports provided valuable bases for interpretation of test results in counseling occupational students. Summaries are reproduced as Exhibit F, and back-up details are available from the project directors.

In connection with our Guided Studies program, before registration we listed students with severe deficiencies (according to CGP test scores) in reading, math, and English. These students were guided into developmental courses in areas of deficiency until the deficiencies are removed. Of 112 enrolled in the first quarter, 55 successfully completed the work in one quarter. Of the remainder, 25 re-enrolled and half of these (12) were still enrolled in the spring. We are continuing on follow-up and analysis of this group of students.

In an effort to serve those in most need, we organized Project S.E.E. (Search, Evaluate, Educate) in cooperation with local public school administrations. By building the data base of high school dropouts during the past two years, we produced mailing labels to communicate with each individual.

Approximately 1200 letters were sent. One group of students received a letter which told about the necessity of continuing one's education. The second group received a letter which listed the programs offered at the college. The responses from the two groups are summarized as follows:

1. Interested in enrolling 58
2. Not interested in enrolling 17

The following summarizes the follow-up of those who said they were interested:

1. 22 enrolled in the Learning Lab
2. 1 enrolled in Radio & Television
3. 2 enrolled in Business Administration
4. 1 enrolled in the Nursing Assistant program.

Thirty-two said they were interested but have not come to the college. The committee has made telephone calls and home visits to many of these students.

The committee is now in the process of reversing the letters to the two groups of students.

We plan to continue and accumulate this type of analytical activity as the data base expands, now that the basic systems are operational.

CONCLUSIONS

Program Planning and Budgeting Systems (PPBS) for educational institutions is a reality--not just a catch phrase--as attested to by the efforts of NCHEMS at WICHE, and the institutions associated with them in developing quantitative measures of an institutions' "product", as well as by most other institutions, nationwide, engaged in similar efforts.

The foundation for PPBS is the data in various files and in the minds of the institutions' staffs on students, faculty, facilities, curriculums, alumni, and the various clients needs. However, data in files accomplishes nothing unless it can be retrieved when needed to answer questions.

A full-blown PPBS is too expensive for most small and medium-sized educational institutions, since it demands computer programming and processing of data, some of which still needs to be collected. However, a first step, for survival and growth to meet clients' needs, is better utilization of data already on hand. It does require an initial investment to organize the data and to develop methods for random access. However, if necessary, staffs can then be reduced, providing better information for less cost in the end. Normally, however, instead of staff reductions, what is achieved is better utilization of staff, freeing them from clerical duties for more professional activities and providing information to improve production without expanding staff as much as would otherwise be necessary with growth.

No truly effective manual system was uncovered for even small institutions (under 500). However, a punched card system is a great improvement over manual

records, and can be obtained inexpensively, usually, by donation of old equipment from industry as it converts to computers, as was the case at Davidson County Community College (donated by Coble Dairies).

Then there are further steps, such as depending on service institutions for computer access and systems development (as at Appalachian Consortium Institutions and at Davidson County Community College); acquisition of computer terminals (the second step by Davidson County Community College); in-house computers, and various combinations of manual, tabulating and computing systems.

No one overall system serves all. All are unique. However, 85-90 percent of activity is not unique.[14] Many systems are available (Commercial, Semi-commercial, Educational at cost), as listed in the "Results" section of this report, and may be used as is, adapted in large part, or be used as guides in developing your own.

The important feature, however, is to build data bases (of students, applicants, alumni, faculty, courses, etc.) on random access files. Then beyond routine processing of day-to-day activities, a wealth of readily accessible data can be turned into management information using utility packages available from a network at no additional cost except for processing.

There is a cost for file development, equipment, and initial programming. Savings are seldom realized, but more information is produced on a more timely, and useful, basis, and much information is available that is not possible to gather by manual means.

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[14] _____. The Education Data Specialist Training Program (Washington: American Association of Community and Junior Colleges, 1973). Unit 5, p. 1.

"The information system is a dynamic system, evolving as needs become apparent, changing as the organization it serves changes, growing as the institution grows, and increasing in sophistication and responsiveness as people become more familiar with the capabilities of the system and as reporting needs change or as users request additional information."[15]

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[15]Fred K. Bellott et al. A Small College Information System (Memphis: Memphis State University) p. 21.

RECOMMENDATIONS

1. The Department of Community Colleges should sponsor at least one session of the Educational Data Specialist Training Program for Registrars, Data Processing Managers, and others responsible for student records. Representatives of all 57 institutions should be urged to take part, with invitations to other public and private institutions.

2. The Community Colleges' ADP Committee, aided by the Division of Management Information Systems of the State Board of Education, should revive its project to develop a system for registration and student records, to be available through NCECS. This should build on the work done by the Appalachian Consortium and NLHE and accommodate the NCHEMS PPBS suggestions for data elements.

3. NCECS should sponsor the requisition of documentation for available management information systems and review them to determine if any existing systems should be added by NCECS to the TUCC library such as The Occupational Education and NCHEMS Systems.

4. The Board of Education should investigate developing random access disk records on high school dropouts, seniors (and juniors) at TUCC for access by Technical Institutes and Community Colleges in articulation efforts.

5. Investigation of the applicability of CGP for all institutes, as in Virginia. This would give common test results for more effective guidance after analyses of validity of a large base of students from the same area.

6. Explore with CGP the acquisition at TUCC of SIGI, the computer-based system of Interactive Guidance and Information, supported by the Carnegie Corporation and NSF.

7. Investigation of the feasibility of automating the Inter-Library Loan and Information Retrieval Network through TUCC so that institutions with terminals can access the data bank directly.

APPENDICES

Exhibit	
A	Typical Questions Requiring Data Analysis
B	Summary or Abstract of Proposed Project
C	Letter Approving Project, with Stipulations
D	Survey Letters and Questionnaire
E	CGP Data
F	Research Results
G	Data Bases for a Small College Information System
H	Alumni Survey

EXHIBIT A
Page 1 of 3

Correlations similar to the following can be obtained by random retrieval from a data bank in various combinations. Three or four variables can be drawn with no trouble. An almost unlimited number of variables can be extracted.

ARTICULATION, ATTRITION

For applicants taking test but not enrolling:

Did they request financial aid?

Was it offered?

Did they have personal problems?

What occupation is the student interested in?

What occupation received highest score on test?

What is occupation of parent?

Does student like to tinker with mechanical things:

How many and what percentage of June __ graduates from ___ high school enrolled here?

How many of these enrolled in summer?

How many of these enrolled in fall?

How many of these enrolled later?

How many of these transferred from another post-secondary school?

What schools?

Had they attended Adult or Extension courses?

What is family income bracket?

For students from _____ high school.

How do grades compare with high school grades?

How do grades compare with placement test scores?

What percentage dropped out?

From what curriculums?

After what length of enrollment?

How many hours were they working?

How many contact hours?

What is ratio of work to contact hours?

How many were deficient in math?

How many were deficient in English?

DROPS

What are number of drops by course and section?

What is curriculum of student?

How many hours is student working?

PLACEMENT AND CURRICULUM DEVELOPMENT

How many course changes year before last?

How many course changes last year?

How many course changes this year?

From what course to what course?

Who is advisor?

TRANSFER STUDENTS

Source school?

Transferred because failing?

Transferred because cost?

Transferred because distance?

COURSE PLANNING AND SCHEDULING

How many students enrolled and accepted?

What curriculum?

What quarter?

How many have not taken MAT 1103?

How many have not taken DFT 1105?

What is room utilization

What is ratio of equipment to student?

What is enrollment compared with last year?

By curriculum?

By course?

What is instructor load by course?

Contact hours and number of students?

Course enrollment -

by day?

by night?

FOLLOW UP

How many June 19__ graduates?

How many changed jobs?

How many got higher salaries?

How many work in _____ County?

How many by curriculum?

ADULT AND EXTENSION PROGRAMS

What is average age of student, by course?

What is occupation of student, by course?

What is enrollment compared with last year?

EXHIBIT B
Page 1 of 2

SUMMARY OR ABSTRACT OF PROPOSED PROJECT

THE PROBLEM TOWARD WHICH THIS PROJECT WILL BE DIRECTED:

Program implementation and improvement, student advisement and related activities, in order to be effectively accomplished, depend on summation and interpretation of data collected from a variety of sources. At present, this institution has the capability of collecting decision making data, and in fact is collecting most of what is now known to be needed. However, much of the data is inaccessible in the form needed, due to the volume of data, the dispersion of files among various offices, and the fact that manual retrieval from manual prepared files organized for specific purposes imposes limitations on reorganization and summation of data for other equally important uses.

The problem, therefore, is one of not being able to retrieve information currently on hand from a variety of sources to analyze the effectiveness of our programs and to guide planning and research. Also, our manual system does not permit the desirable flexibility in timely purging of superfluous data and the gathering and utilizing of new classifications of data as need becomes evident.

OBJECTIVES OF THIS PROJECT:

The primary objective of this project will be to study systems of automated data storage and retrieval currently in use or proposed by other studies, and to choose and adapt to our use the one system found to be most appropriate for our institution, in order to provide timely retrieval of management information on potential enrollees, students, faculty, alumni, curriculum and scheduling.

The information produced from the data organized by this selected and refined system will be used to measure the effectiveness of articulation, guidance, curriculum, and placement, for program evaluation, and to serve as guidelines for continuing identification and refinement of the data base for management information.

SUMMARY OF PROPOSED PROCEDURES:

Phase I. A. Study systems now in use in similar institutions and review literature on similar research studies already completed or now in progress.

B. Concurrently (to capitalize on effort already invested in this direction) implement Registration and Grade Recording System that is in final stages of development. Using this system as a comparative base for the systems studies under Phase IA, above, it is felt that this may well serve as a base for the more comprehensive Management Information System we need.

C. Continue the start made toward collecting additional data on former students.

Phase II. Building on these bases, determine the specific output desired from the system for most effective program evaluation, determine the data and organization of data needed to produce this output, and develop systems for gathering, storing, and retrieving. Analyze, evaluate, and refine system.

Phase III. Document the system, relate it to others such as Forsyth Tech's system for determining community needs, and disseminate.

PROPOSED UTILIZATION OF FINDINGS:

We expect this project to result in the adaptation or development of a system of automated data gathering and storage for retrieval of management information that will guide us in the improvement of our student and prospective enrollee guidance, curriculum, scheduling, and planning. It will also provide the base for continuing institutional research.

It will be made available to all institutions offering similar programs.

EXHIBIT C

DEPARTMENT OF
COMMUNITY COLLEGES
NORTH CAROLINA STATE BOARD OF EDUCATION
RALEIGH 27602

BEN E. FOUNTAIN, JR
DIRECTOR

June 3, 1971

President Grady E. Love
Davidson County Community College
P. O. Box 1287
Lexington, North Carolina 27292

Dear President Love:

A total of twenty-five applications for research projects under Part C of P. L. 90-576 have been received by the Occupational Research Unit and submitted to The State Board of Education. The Board, at its regular meeting on June 3, 1971, approved the following application from your Institution based upon the dates, costs, and stipulations specified below.

Project	:	"Development of System to Measure Effectiveness of Occupational Programs"
Dates	:	July 1, 1971 - June 30, 1973 (24 months)
Costs	:	$20,850
Stipulations:		Produce report of findings of other systems studies; investigate State supported services and software with Mr. Steve Painter of the North Carolina Educational Computing Service; funds used only for the area of occupational education

The Occupational Research Unit will contact you shortly concerning project implementation.

Sincerely,

Fred W. Manley

Fred W. Manley, Assistant Director
Occupational Research Unit

Ben E. Fountain, Jr.

Ben E. Fountain, Jr., Director
Department of Community Colleges

FWM/BEF/dfa

EXHIBIT D1

DAVIDSON COUNTY COMMUNITY COLLEGE
Intersection of Old Greensboro Road and Interstate 85
LEXINGTON, NORTH CAROLINA 27292

P. O. BOX 1287

TELEPHONES:
LEXINGTON: AREA CODE: 704-249-8186
THOMASVILLE: AREA CODE: 919-475-1916

September 22, 1971

TO: Presidents
Directors of Occupational Education

FROM: Dr. Grady E. Love, President

SUBJECT: OCCUPATIONAL EDUCATION RESEARCH PROJECT

I would like to enlist your participation in the Occupational Education Research Project that we have undertaken. The object is to develop a system to measure the effectiveness of occupational programs.

The first phase of this project is to study methods currently employed in providing administrations with information reports on potential enrollees, students, faculty, alumni, curriculum and scheduling; for measuring the effectiveness of articulation, guidance, curriculum and placement. We will then attempt to develop and test a system incorporating adaptations of the most appropriate elements of existing systems.

We would appreciate your letting us know what your institution is doing in this regard, either by written summary or by inviting the project director, Mr. Frank A. Thacker, to visit the personnel most directly involved to review in some detail your present system.

This phase of the project is scheduled for completion by December 31, 1971. Summaries of the entire two-year project will be disseminated on completion.

pb

EXHIBIT D2

DAVIDSON COUNTY COMMUNITY COLLEGE
Intersection of Old Greensboro Road and Interstate 85
LEXINGTON, NORTH CAROLINA 27292

TELEPHONES:
LEXINGTON: AREA CODE: 704-249-8186
THOMASVILLE: AREA CODE: 919-475-1915

P. O. BOX 1287

November 19, 1971

I would like to enlist your participation in an Occupational Education Research Project that we have undertaken.

Summarizing the attached abstract of the project, the objective is to develop a system that will make data already in files, or relatively easily obtainable, more useful for a variety of administrative purposes. All indications so far point to employment of an automated data processing system dependent upon computer or tabulating equipment for access to a data bank, such as NCHE's RELCV Information System. However, since we do not have direct access to such equipment, and the majority of institutions do not, we are anxious to uncover any manual systems that will serve, if such exist.

Other institutions are undertaking research to develop better methods of obtaining data on community needs, status of alumni, guidance, and the like. Therefore, our project is more concerned with a system permitting quantitive measures of the effectiveness of programs in existence, from data on hand as well as that to be gathered, as a result of newly developed and adapted programs.

With this attempt to bring into better focus the object of our program, I would appreciate very much your comments based on the attached questionnaire.

Yours truly,

Frank A. Thacker, Chairman
Business Education Department

mb

Attachments

EXHIBIT D3

DAVIDSON COUNTY COMMUNITY COLLEGE
Intersection of Old Greensboro Road and Interstate 85
LEXINGTON, NORTH CAROLINA 27292

46

TELEPHONES:
LEXINGTON: AREA CODE: 704-249-8186
THOMASVILLE: AREA CODE: 919-475-1915

P. O. BOX 1287

November 23, 1971

Thank you for your reply to Dr. Love's letter requesting your help in our Occupational Education Research Project.

After reviewing the replies and visiting some institutions, I believe it will be more productive to ask you to complete a questionnaire before I accept more invitations to visit.

Summarizing the attached abstract of the project, the objective is to develop a system that will make data already in files, or relatively easily obtainable, more useful for a variety of administrative purposes. All indications so far point to employment of an automated data processing system dependent upon computer or tabulating equipment for access to a data bank, such as NHLE's RELCV Information System. However, since we do not have direct access to such equipment, and the majority of institutions do not, we are anxious to uncover any manual systems that will serve, if such exist.

Other institutions are undertaking research to develop better methods of obtaining data on community needs, status of alumni, guidance, and the like. Therefore, our project is more concerned with a system permitting quantitive measures of the effectiveness of programs in existence, from data on hand as well as that to be gathered, as a result of newly developed and adapted programs.

With this attempt to bring into better focus the object of our program, I would appreciate very much your comments based on the attached questionnaire.

Yours truly,

Frank A. Thacker

Frank A. Thacker, Chairman
Business Education Department

Attachments

EXHIBIT D4
Page 1 of 2
OCCUPATIONAL INFORMATION SYSTEM

Q U E S T I O N N A I R E

I. Do you currently have an <u>automatic system</u> for <u>retrieving quantitive data</u> from your files for measuring the effectiveness of your activities in areas of:

	Yes	No		Yes	No
Articulation	☐	☐	Remedial program (s)	☐	☐
Student Advisement	☐	☐	Financial aid	☐	☐
Curriculum planning	☐	☐	Program Placement	☐	☐
Scheduling	☐	☐	Placement (Job & Colleges)	☐	☐
			Other _____	☐	☐

II. If so, is the system (are the systems) Manual ☐ Automated ☐?

A. If manual, are you relatively satisfied with its effectiveness? Please describe briefly, estimating cost for manpower and equipment.

B. If automated,

1. Equipment employed:
   - ☐ Mechanical Bookkeeping
   - ☐ Electronic Bookkeeping
   - ☐ Unit Record Tabulating
   - ☐ Terminal (Computer)
   - ☐ In-House Computer
   - ☐ Service Bureau
   - ☐ Other _____

2. Software employed (Please attach copies of any available flow charts):
   - ☐ NLHE's RELCV Information System
   - ☐ Other Commercial System
   - ☐ Own Development
   - ☐ Other _____

3. Data Base (Please attach copies of any available listing of data):
   - ☐ Student Personal Data
   - ☐ Registration
   - ☐ Grading
   - ☐ Admission or Placement Tests Results
   - ☐ Alumni
   - ☐ Faculty
   - ☐ Occupational Information
   - ☐ Other _____

III. For each of the items under Item I (above) with "yes" for an answer, please give

System (Name) _____
Sources of data (People or Organization) _____
Source Document _____
Nature of Data _____
Description of Storage Medium _____
Description of Access Medium _____
Use _____

System (Name) _____
Sources of data (People or Organization) _____
Source Document _____
Nature of Data _____
Description of Storage Medium _____
Description of Access Medium _____
Use _____

IV. Admissions Tests Used

- ☐ ESC-GATB
- ☐ ETS-SCAT
- ☐ ETS-SAT
- ☐ ETS-CGP
- ☐ Other _____
- ☐ Other _____

V. If you use an Alumni Questionnaire, please attach a copy.

VI. List of data needs not currently available, and anticipated use.

VII. Comments:

EDUCATIONAL TESTING SERVICE - DATA PROCESSING SERVICES - PUNCHED CARD LAYOUT # _____

Program/Project CGP 1972-73 Operating Year P/J 175-Ø8

Card Description Punch Card Score Report (1 of 3) Preprinted Card? NO Card Form # _____

Input to D.P. Job Nos. _____ Output from CGPA2Ø

Issued By N. Heath Date 10/4/72 KP Units: Alpha _____ Numeric _____ Total _____

1	ETS STUDENT SERIAL NUMBER	COLLEGE CODE	1	40	AGE AT TEST DATE (ROUNDED TO NEAREST YEAR)		40
2			2	41			41
3			3	42	SOCIAL SECURITY NUMBER		42
4			4	43			43
5		SERIAL NUMBER	5	44			44
6			6	45			45
7			7	46			46
8			8	47			47
9			9	48			48
10	CARD CODE = 1		10	49			49
11	STUDENT NAME	LAST	11	50			50
12			12	51	HIGH SCHOOL CODE		51
13			13	52			52
14			14	53			53
15			15	54			54
16			16	55			55
17			17	56			56
18			18	57	ADVISOR CODE		57
19			19	58			58
20			20	59	COMPARATIVE INTEREST INDEX SCORES	MATHEMATICS	59
21			21	60			60
22			22	61		PHYSICAL SCIENCES	61
23			23	62			62
24			24	63		ENGINEERING TECHNOLOGY	63
25		FIRST	25	64			64
26			26	65		BIOLOGY	65
27			27	66			66
28			28	67		HEALTH	67
29			29	68			68
30		MIDDLE INITIAL	30	69		HOME ECONOMICS	69
31	SEX 1=M, 2=F, BLANK=NOT INDICATED		31	70			70
32	CURRICULUM CODE		32	71		SECRETARIAL	71
33			33	72			72
34			34	73		BUSINESS	73
35			35	74			74
36	TEST DATE	MONTH	36	75		SOCIAL SCIENCES	75
37			37	76			76
38		YEAR	38	77		FINE ARTS	77
39			39	78			78
40			40	79		MUSIC	79
				80			80

Explanation

EDUCATIONAL TESTING SERVICE - DATA PROCESSING SERVICES - PUNCHED CARD LAYOUT # 50

Program/Project CGP 1972-73 Operating Year P/J 175-Ø8

Card Description Punch Card Score Report (2 of 3) Preprinted Card? NO Card Form #

Input to D.P. Job Nos. Output from CGPA20

Issued By N. Heath Date 10/4/72 KP Units: Alpha Numeric Total

1		COLLEGE CODE	1	41		D	41
2	ETS		2	42	LOCAL QUESTION	E	42
3	STUDENT		3	43		F	43
4	SERIAL		4	44	RESPONSES (CONT.)	G	44
5	NUMBER		5	45		H	45
6		SERIAL NUMBER	6	46		I	46
7			7	47		J	47
8			8	48		1	48
9			9	49		2	49
10	CARD CODE=2		10	50		3	50
11			11	51		4	51
12		READING	12	52		5	52
13		SENTENCES	13	53	BIOGRAPHICAL	6	53
14			14	54		7	54
15		MATH TOTAL	15	55	INVENTORY	8	55
16	TEST		16	56		9	56
17		MATH PART 1	17	57	RESPONSES	10	57
18	SCORES		18	58		11	58
19		MATH PART 2	19	59	***	12	59
20			20	60		13	60
21		*MATH TEST CODE	21	61		14	61
22		YEAR 2000	22	62		15	62
23			23	63		16	63
24		MOSAIC	24	64		17	64
25		COMPARISONS	25	65		18	65
26		LETTER	26	66		19	66
27		GROUPS	27	67		20	67
28		ACADEMIC	28	68		21	68
29		MOTIVATION	29	69		22	69
30		ENGLISH	30	70		23	70
31	HIGH SCHOOL		31	71		24	71
32	AVERAGES	MATH	32	72		25	72
33			33	73		26	73
34		LESS THAN $1400	34	74		27	74
35	FNI ** COST	$1400-$2000	35	75		28	75
36	LEVELS	$2001-$3000	36	76		29	76
37		OVER $3000	37	77		30	77
38		A	38	78		31	78
39	LOCAL QUESTION	B	39	79		32	79
40	RESPONSES	C	40	80		33	80

Explanation

*3=MATH C
4=MATH D
5=MATH E

**FNI:
C=CONSIDERABLE NEED
S=SOME NEED
N=NO NEED
*=NEED MORE INFORMATION

Ø=SELF-SUPPORTING
BLANK=INSUFFICIENT INFORMATION

***
ALL RESPONSES ARE CODED NUMERIC, 1-9, FOLLOWED BY A=10,B=11,ETC.

E[illegible]CATIONAL TESTING SERVICE - DATA PROCESSING SERVICES - PUNCHED CARD LAYOUT #_____

Program/Project CGP 1972-73 Operating Year P/J 175-08

Card Description Punch Card Score Report (3 of 3) Preprinted Card?_____ Card Form #_____

Input to D.P. Job Nos. _____ Output from CGPA20

Issued By N. Heath Date 10/4/72 KP Units: Alpha _____ Numeric _____ Total _____

1	ETS STUDENT SERIAL NUMBER	COLLEGE CODE	1	40				40
2			2	41				41
3			3	42				42
4			4	43				43
5		SERIAL NUMBER	5	44	LOCAL CODE			44
6			6	45				45
7			7	46				46
8			8	47				47
9			9	48				48
10	CARD CODE = 3		10	49				49
11		34	11	50		MONTH		50
12		35	12	51				51
13		36	13	52	BIRTH DATE	DAY		52
14		37	14	53				53
15		38	15	54		YEAR		54
16	BIOGRAPHICAL	39	16	55				55
17		40	17	56				56
18	INVENTORY	41	18	57				57
19		42	19	58				58
20	RESPONSES*	43	20	59				59
21		44 FATHER	21	60				60
22		44 MOTHER	22	61				61
23		45 FATHER	23	62				62
24		45 MOTHER	24	63				63
25		46	25	64				64
26		47 ENG LAST	26	65				65
27		47 ENG NEXT	27	66	BLANK			66
28		47 MTH LAST	28	67				67
29		47 MTH NEXT	29	68				68
30		48	30	69				69
31		49	31	70				70
32		50	32	71				71
33		51	33	72				72
34		52	34	73				73
35		53	35	74				74
36		54	36	75				75
37		55	37	76				76
38		56	38	77				77
39		57	39	78				78
				79				79
				80				80

Explanation

*ALL RESPONSES ARE CODED NUMERIC, 1-9, FOLLOWED BY A=10, B=11, ETC.

Soper, Dorothy A.

AN ANALYSIS OF THE RELATIONSHIP BETWEEN FACTORS ON THE COMPARATIVE GUIDANCE AND PLACEMENT TEST AND PERSISTENCE AMONG FRESHMEN COMMUNITY COLLEGE STUDENTS

Research report under the direction of Thomas M. Elmore, Ph. D., Director of Counselor Education, Wake Forest University.

A study was conducted to determine the value of the Comparative Guidance and Placement Test, developed by Educational Testing Service, in predicting persistence in college among community college students. Subjects were selected from the college transfer program and the technical program at Davidson County Community College in Lexington, North Carolina. Analyses of variance were run on the variables included in the Interest Index and the Ability Tests. Chi-square tests were performed on age and financial need to see if there was an overall relationship between these factors and persistence. It was hypothesized that there would be no significant difference between persisters and non-persisters on any of the variables relating to the Interest Index, that there would be no significant difference between persisters and non-persisters on any of the items relating to the variables on the Ability Tests, and that there would be no

significant difference between persisters and non-persisters according to age and financial need. The variables in the Ability Tests proved to be the best predictors of persistence among students in the technical program. Specifically, the scores on the reading, verbal, sentences and mathematics tests proved to be the best predictors of persistence. The variables on the Interest Index were poor predictors of persistence for students in both programs. Age and financial need proved to be unrelated to persistence.

Zimmerman, Gene G.

THE RELATION OF SELECTED STUDENT VARIABLES TO THE ACADEMIC MOTIVATION SCORES OF COMMUNITY COLLEGE STUDENTS

Research report under the direction of Dr. Thomas M. Elmore, Ph.D., Associate Professor of Educational and Counseling Psychology.

A study of entering community college students was conducted to determine the difference in Academic Motivation scores on the Comparative Guidance and Placement Test between and within the college transfer, technical, and vocational programs in relation to the variables of sex, age, race, financial status, residence, and interests. An analysis of variance and Duncan's Multiple Range Test was run to determine the interactions among the foregoing groups according to the several variables.

Major findings included the following: there was no significant difference in Academic Motivation scores between college transfer, technical, and vocational students when selected variables were not taken into account. However, females scored significantly higher than males in Academic Motivation; college transfer students age 20 or under scored significantly higher in Academic Motivation than students over age 20; non-caucasian students scored significantly higher than caucasians in academic motivation; students

needing financial aid scored significantly higher in Academic Motivation than self-supporting students; and students indicating a high interest in at least three areas scored significantly higher than students with less pronounced interests.

Implications for counseling in a community college were cited.

EXHIBIT G

FREED-HARDEMAN DISK FILES

FHC14	2002	850	6800,40	Class card file	6800
FHC16	2002	600	1200,160	Master card file	1200
FHC79	2002	24	500,15	Error file for no address	500
FHC80	2002	20	200,32	President's list	200
FHC81	2002	20	200,32	Dean's list	200
FHC82	2002	20	200,32	Probation list	200
FHC83	2002	20	200,32	Suspensions	200
SOR33	2002	20	200,32	Sort file	
		1574	.....	Define Fixed Area at 198 cylinders	
FHC75	2001	150	1200,40	Address file	1200
FHC67	2001	4	50,24	Codes for enrollment register	50
FHC13	2001	3	3,320	Heading file (student schedule)	
FHC28	2001	5	100,15	Counties	100
FHC36	2001	120	1200,32	Home town	1200
FHC31	2001	5	80,20	Majors	80
FHC77	2001	60	1200,16	Quality point file	1200
FHC26	2001	4	64,20	States	64
FHC12	2001	7	101,20	Teacher's file	101
FHC15	2001	20	20,320		
FHC5B	2001	3	3,320	Sort file index	
FHC20	2001	32	51,220	Courses offered this Semester	512
FHC21	2001	2	2,320	Section Numbers of FHC20	2
		415	.....	Define Fixed Area 54 Cylinders	

From A Small College Information System, Bellott, Fred K. and Bliss, Sam W., College of Education, Memphis State University.

EXHIBIT H
Page 1 of 4

DAVIDSON COUNTY COMMUNITY COLLEGE
Intersection of Old Greensboro Road and Interstate 85
LEXINGTON, NORTH CAROLINA 27292

P. O. BOX 1287

TELEPHONES:
LEXINGTON: AREA CODE: 704-249-8186
THOMASVILLE: AREA CODE: 919-475-1918

57

October 16, 1972

Dear D.C.C.C. Alumni:

The Alumni Association of Davidson County Community College would appreciate your taking the time to complete the enclosed questionnaire.

As you are no doubt aware, the college is undergoing a great deal of change at this time and there is reason to believe that this trend will continue for some time to come. Suggestions are being made for new programs, enrollment growths are continuing, the physical facilities are no longer adequate, just to name a few of the changes.

The administration and the faculty at the college need to evaluate what they are doing and what they have done in the past in order to make plans for future changes. They need your help and have asked me to coordinate a follow-up study in order that they might get some idea of just how successful they have been in guiding you.

It is important that you know that all the information you supply will be kept confidential, with answers being used for group analysis. Individual identification, if given, will be used for control purposes only, unless you authorize its use for correlation with school records for statistical research only.

I hope that you will take time, right now, to fill out the questionnaire and return it so that I may have it by November 1, 1972.

Thank you for your time and consideration.

Sincerely,

Dewey E. Brantley

Dewey Brantley
Alumni Association President

DB/js
Enclosure

DAVIDSON COUNTY COMMUNITY COLLEGE ALUMNI SURVEY

(The information you give will be treated as confidential, with answers being used for group analysis. Individual identification, if given, will be used for control purposes only, unless you authorize its use for correlation with school records for statistical research only, by checking here ☐ .)

I. PERSONAL INFORMATION (optional)

SOCIAL SECURITY NUMBER: _____ – _____ – _____

NAME: Mr. Mrs. Miss _____
LAST FIRST MIDDLE—INITIAL MAIDEN (IF USED AT DCCC)

ADDRESS _____
STREET OR ROUTE & BOX NO. CITY COUNTY STATE ZIP

TELEPHONE: ( ) _____
AREA

Is this the same address to which this form was mailed?
Yes ☐ No ☐

II. STATISTICAL INFORMATION

Last year at DCCC: 19_____ Graduated: Yes ☐ No ☐

Curriculum: College Transfer ☐ Technical ☐ Vocational ☐

List specific program: _____

If you changed programs what program did you originally enter? _____

Age Range: 20-24 ☐ 25-29 ☐ 30-34 ☐ over 35 ☐

Marital Status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

Male ☐ Female ☐ Ages of Children: _____ _____ _____ _____

Self-employed ☐ Employed ☐ * Housewife ☐ *Unemployed ☐

* (If currently housewife or unemployed, but did work since leaving school, check here ☐ and answer employment questions in Part III as if you were in your last position.)

Job title or classification (major job): _____

Employer or business (optional) _____

Business Address: _____

III. EMPLOYMENT

1. What is your employment status?

FULL-TIME JOB ARRANGEMENTS

One full-time job _____

Two full-time jobs _____

One full-time and one part-time job _____

One full-time and two or more part-time jobs _____

PART-TIME JOB ARRANGEMENTS

One part-time job _____

Two or more part-time jobs _____

UNEMPLOYED _____

2. Salary: (Gross)

Beginning $ _____

Current (or last) $ _____

Weekly ☐ Monthly ☐ Annual ☐

Question not applicable ☐

3. How did you obtain your first job after completing your educational experience at this institution?

Had it before graduation _____

With school's help _____

Through an employment agency _____

Found it myself _____

Went into military service _____

Other _____

_____

_____

4. How necessary was the degree or diploma you received at this institution in regard to obtaining your major position?

Required _____

Very necessary _____

Helpful _____

No help at all _____

Question not applicable _____

5. Did work completed at DCCC qualify you for a job promotion?

Yes ☐ No ☐

6. If you are employed outside your field of preparation, Why?

Waiting for job in field _____

Did not like field _____

Geographic preference _____

Question not applicable _____

Other _____

7. If not presently employed, why are you out of work?

Waiting for job in the field _____

Obtaining more education or training _____

Dissatisfied with previous job and looking for work in another field _____

Housewife _____

Question not applicable _____

Other _____

8. Do you wish to have help at this time in obtaining or in changing jobs?

Yes ☐ No ☐

IV. ADDITIONAL EDUCATIONAL EXPERIENCES

If you enrolled in another institution after leaving DCCC:

Name of institution (s): _____

_____

Curriculum: _____ Grade Point Average _____

_____ _____

Graduate ☐ Still student, expect to graduate ☐ Special Courses ☐

Did the program of study at DCCC prepare you for your program of study at the institution to which you transferred? Yes ☐ No. ☐

If DCCC courses were not accepted by institution, indicate reason:

No comparable course _____ Institution would not accept credits _____

Switched fields _____ List those courses not accepted: _____

Limit on transfer of credits _____ _____

Other _____ _____

Question not applicable _____

V. EVALUATION OF DCCC

Using the scale, 1. Excellent 2. Good 3. Fair 4. Poor Rate the following:

a. Counseling staff _____ c. Faculty as instructors _____

b. Faculty as advisors _____ d. Curriculum _____

If you withdrew before graduation, indicate the reason:

Financial ☐ Academic ☐ Transferred ☐ Entered Armed Forces ☐

Marriage ☐ Relocated ☐ Changed jobs ☐ Other ☐

Explain: _____

Would you recommend DCCC to prospective students? Yes ☐ No ☐

Use the reverse side for any comments.

Thank you for completing this questionnaire.

IDENTIFICATION OF ACRONYMS

AACJC	American Association of Community and Junior Colleges, 1973
ADP	Administrative Data Processing
AIDS	Administrative Information Distribution System
ASU	Appalachian State University
CGP	Comparative Guidance and Placement (Tests)
ERIC	Educational Resources Information Center
HEGIS	Higher Education General Information Survey
IBM	International Business Machines, Inc.
MIS	Management Information Systems, Division of the State Board of Education
NCESC	North Carolina Educational Computing Service
NCHEMS	National Center for Higher Education Management Systems
NLHE	National Laboratory for Higher Education
PPBS	Program Planning and Budgeting Systems
TUCC	Triangle Universities Computation Center
USOE	United States Office of Education (Department of Health, Education, and Welfare)
WICHE	Western Interstate Commission for Higher Education

BIBLIOGRAPHY

Alcorn, Bruce K. ed. NECS News. Waco: Western Institute for Science and Technology, various.

Bellott, Fred K. and Bliss, Sam W. A Small College Information System. Memphis: Memphis State University.

Haga, Enoch, ed. Automated Educational Systems. Elmhurst, Illinois: The Business Press, 1967.

Huff, Robert A. and Manning, Charles W. Higher Education Planning and Management Systems. Boulder: National Center for Higher Education Management Systems at WICHE, May, 1972.

Katz, Martin; Chapman, Warren; and Godwin, William, "GIGI--A Computer--Based Aid to Career Decision-Making." EDUCOM Bulletin. Princeton: Inter University Communications Council, Summer, 1972.

Menefee, Audrey, ed. Development and Use of a Common Data Bank. Sacramento: California Junior College Association, 1968. (ED021536)

President's Science Advisory Committee. Computers in Higher Education. Washington: Superintendent of Documents, February, 1967. (ED029518)

Price, Wilson T. Introduction to Data Processing. San Franscisco: Rinehart Press, 1972.

Roesler, Elmo V., ed. Appalachian Developing Institutions Consortium Progress Report No. 3. Boone, N. C.: Appalachian State University, February, 1973.

Shoemaker, William A. Systems Models and Programs for Higher Education. Washington, D. C. 20036: Academy for Educational Development, Inc., April, 1973.

United States Office of Education. How to Use Eric. Washington, D. C. Superintendent of Documents, 1971.

_____. ASAP File Maintenance and Information Retrieval System Reference Manual. Ithaca: Compuvisor Inc., 1971.

_____. Applied Programs for Schools. Dayton, NCR, undated.

_____. CGP, A Program for Two-Year Colleges & Vocational-Technical Institutes. Princeton: The College Entrance Examination Board, 1972.

_____. EPIC. White Plains: IBM, 1971.

_____. Program Classification Structure. Boulder: National Center for Higher Education Management Systems at WICHE: June, 1972.

_____. The Educational Data Specialist Training Program. Washington: American Association of Community and Junior Colleges, 1973.

_____. Thesis. Omaha: Dataflex Corporation.

_____. Triton College. Boulder: Western Interstate Commission for Higher Education, May 1973.